

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

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Sheet 1 of 5

Complete if Known

Application Number	10/602,323
Filing Date	June 24, 2003
First Named Inventor	Ahn, Kie
Group Art Unit	2823
Examiner Name	Toledo, Fernando

Attorney Docket No: 1303.101US1

US PATENT DOCUMENTS

Examiner Initial	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
	US-02/0089023	07/11/2002	Yu, Zhiyi , et al.	01/05/2001
	US-2001/0002280	05/31/2001	Sneh, Ofer	12/22/2000
	US-2001/0009695-A1	07/26/2001	Saanila, Ville A., et al.	01/18/2001
	US-2001/0030352-A1	10/18/2001	Ruff, Alexander , et al.	02/28/2001
	US-2001/0042505	11/22/2001	Vaartstra, Brian A.	07/18/2001
	US-2002/0001971	01/03/2002	Cho, Hag-ju	06/27/2001
	US-2002/0155688	10/24/2002	Ahn, Kie Y., et al.	04/20/2001
	US-2002/0155689	10/24/2002	Ahn, Kie Y., et al.	02/11/2002
	US-2002/0192974	12/19/2002	Ahn, Kie Y., et al.	06/13/2001
	US-2002/0024080	02/28/2002	Derderian, Garo J., et al.	06/11/2001
	US-2002/0025628	02/28/2002	Derderian, Garo J., et al.	06/14/2001
	US-2002/0046705	04/25/2002	Sandhu, Gurtej S., et al.	10/22/2001
	US-2002/0086555	07/04/2002	Ahn, Kie Y., et al.	11/05/2001
	US-2002/0094632-A1	07/18/2002	Agarwal, V. K., et al.	01/15/2002
	US-2002/0100418	08/01/2002	Sandhu, Gurtej S., et al.	03/11/2002
	US-2002/0102818	08/01/2002	Sandhu, Gurtej S., et al.	03/22/2002
	US-2002/0110991	08/15/2002	Li, Weiman	02/13/2001
	US-2002/0111001	08/15/2002	Ahn, Kie Y., et al.	02/09/2001
	US-2002/0122885	09/05/2002	Ahn, Kie Y.	03/01/2001
	US-2002/0130338	09/19/2002	Ahn, Kie Y., et al.	03/15/2001
	US-2002/0146916-A1	10/10/2002	Irino, Kiyoshi , et al.	03/29/2002
	US-2002/0164420	11/07/2002	Derderian, Garo , et al.	02/25/2002
	US-2002/0195056	12/26/2002	Sandhu, G. , et al.	12/26/2002
	US-2003/0017717	01/23/2003	Ahn, Kie Y., et al.	07/18/2001
	US-2003/0003702	01/02/2003	Ahn, Kie Y., et al.	08/26/2002
	US-2003/0003722	01/02/2003	Vaartstra, Brian A.	08/19/2002
	US-2003/0003730	01/02/2003	Li, Weiman	08/28/2002
	US-2003/0045082	03/06/2003	Eldridge, Jerome , et al.	02/20/2002
	US-2003/0048666	03/13/2003	Eldridge, Jerome M., et al.	06/21/2002
	US-2003/0124794-A1	07/03/2003	Girardie, Lionel	12/13/2002
	US-2003/0157764	08/21/2003	Ahn, Kie Y., et al.	02/20/2002
	US-2003/0170389	09/11/2003	Sandhu, Gurtej S.	03/05/2002
	US-2003/0170403	09/11/2003	Doan, Trung T., et al.	03/11/2002
	US-2003/0175411-A1	09/18/2003	Kodas, Toivo T., et al.	10/04/2002
	US-2003/0181039	09/25/2003	Sandhu, Gurtej S., et al.	03/18/2003
	US-2003/0183156	10/02/2003	Dando, Ross , et al.	03/26/2002
	US-2003/0193061-A1	10/16/2003	Osten, Hans-Joerg	06/05/2003
	US-2003/0194862	10/16/2003	Mardian, Allen P.	01/10/2003
	US-2003/0203626	10/30/2003	Derderian, Garo J., et al.	04/25/2002
	US-2003/0207032	11/06/2003	Ahn, Kie Y., et al.	05/02/2002

EXAMINER

DATE CONSIDERED

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Attorney Docket No: 1303.101US1

US-2003/0207540	11/06/2003	Ahn, Kie Y., et al.	05/02/2002
US-2003/0207593	11/06/2003	Derderian, Garo J.	05/02/2002
US-2003/0207593-A1	11/06/2003	Derderian, G. J., et al.	05/02/2002
US-2003/0227033	12/11/2003	Ahn, Kie Y., et al.	06/05/2002
US-2003/0232511-A1	12/18/2003	Metzner, C. R., et al.	09/19/2002
US-2003/0235961-A1	12/25/2003	Metzner, C. , et al.	04/04/2003
US-2004/0004244	01/08/2004	Ahn, Kie Y., et al.	06/20/2003
US-2004/0004247	01/08/2004	Forbes, Leonard , et al.	07/08/2002
US-2004/0004859	01/08/2004	Forbes, Leonard , et al.	07/08/2002
US-2004/0007171-A1	01/15/2004	Ritala, Mikko , et al.	07/10/2003
US-2004/0033681	02/19/2004	Ahn, Kie Y., et al.	08/15/2002
US-2004/0033701-A1	02/19/2004	Ahn, K. Y., et al.	08/15/2002
US-2004/0038525-A1	02/26/2004	Meng, S. , et al.	08/26/2002
US-2004/0099889-A1	05/27/2004	Frank, M. M., et al.	11/27/2002
US-2004/0144980-A1	07/29/2004	Ahn, Kie Y., et al.	01/29/2003
US-2004/0214399-A1	10/28/2004	Ahn, K. Y., et al.	04/22/2003
US-2004/0222476-A1	11/11/2004	Ahn, K. Y., et al.	06/09/2004
US-2004/0262700-A1	12/30/2004	Ahn, K. Y., et al.	06/24/2003
US-2005/0023584-A1	02/03/2005	Derderian, G. J., et al.	02/03/2005
US-2005/0023594-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0023624-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0023625-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0023626-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0023627-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0026374-A1	02/03/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0029604-A1	02/21/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0029605-A1	02/10/2005	Ahn, K Y., et al.	08/31/2004
US-2005/0032292-A1	02/10/2005	Ahn, K. Y., et al.	08/31/2004
US-2005/0034662-A1	02/17/2005	Ahn, K. Y.	08/31/2004
US-3,357,961	12/12/1967	Makowski, H. S., et al.	05/24/1965
US-4,058,430	11/15/1977	Suntola, T. , et al.	11/25/1975
US-4,413,022	11/01/1983	Suntola, Tuomo S., et al.	06/21/1979
US-4,993,358	02/19/1991	Mahawili, Imad	07/28/1989
US-5,055,319	10/08/1991	Bunshah, Rointan F., et al.	04/02/1990
US-5,302,461	04/12/1994	Anthony, T. C.	06/05/1992
US-5,625,233	04/29/1997	Cabral, Jr., C. , et al.	01/13/1995
US-5,801,105	09/01/1998	Yano, Yoshihiko , et al.	06/14/1996
US-5,810,923	09/22/1998	Yano, Yoshihiko , et al.	05/10/1996
US-5,828,080	10/27/1998	Yano, Yoshihiko , et al.	04/17/1995
US-5,912,797	06/15/1999	Schneemeyer, L. F., et al.	09/24/1997
US-5,916,365	06/29/1999	Sherman, Arthur	08/16/1996
US-6,013,553	01/11/2000	Wallace, Robert , et al.	07/15/1998
US-6,020,024	02/01/2000	Maiti, Bikas , et al.	08/04/1997

EXAMINER

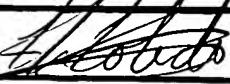
DATE CONSIDERED

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		<i>Complete if Known</i> Application Number 10/602,323 Filing Date June 24, 2003 First Named Inventor Ahn, Kie Group Art Unit 2823 Examiner Name Toledo, Fernando	
Sheet 3 of 5		Attorney Docket No: 1303.101US1	

US-6,025,627	02/15/2000	Forbes, Leonard , et al.	05/29/1998
US-6,203,613	03/20/2001	Gates, Stephen M., et al.	10/19/1999
US-6,207,589	03/27/2001	Ma, Yanjun , et al.	02/29/2000
US-6,273,951	08/14/2001	Vaartstra, Brian A.	06/16/1999
US-6,291,866	09/18/2001	Wallace, Robert M., et al.	10/20/1999
US-6,294,813	09/25/2001	Forbes, Leonard , et al.	02/15/2000
US-6,297,539	10/02/2001	Ma, Yanjun , et al.	07/06/2000
US-6,331,465	12/18/2001	Forbes, Leonard , et al.	02/15/2000
US-6,348,386	02/19/2002	Gilmer, David C.	04/16/2001
US-6,387,712	05/14/2002	Yano, Yoshihiko , et al.	12/03/1999
US-6,420,230	07/16/2002	Derderian, Garo , et al.	08/31/2000
US-6,420,279	07/16/2002	Ono, Yoshi , et al.	06/28/2001
US-6,448,192	09/10/2002	Kaushik, Vidya S.	04/16/2001
US-6,451,641	09/17/2002	Halliayal, Arvind , et al.	02/27/2002
US-6,451,695	09/17/2002	Sneh, Ofer	12/22/2000
US-6,458,701	10/01/2002	Chae, Yun-sook , et al.	10/12/2000
US-6,465,334	10/15/2002	Buynoski, Matthew S., et al.	10/05/2000
US-6,482,740	11/19/2002	Soininen, Pekka J., et al.	05/15/2001
US-6,495,436	12/17/2002	Ahn, Kie Y., et al.	02/09/2001
US-6,514,828	02/04/2003	Ahn, Kie Y., et al.	04/20/2001
US-6,521,911	02/18/2003	Parsons, Gregory N., et al.	07/19/2001
US-6,524,867	02/25/2003	Yang, Haining , et al.	12/28/2000
US-6,527,866	03/04/2003	Matijasevic, Vladimir , et al.	02/09/2000
US-6,531,354	03/11/2003	Maria, J. , et al.	01/17/2001
US-6,534,420	03/18/2003	Ahn, Kie Y., et al.	07/18/2001
US-6,537,613	03/25/2003	Senzaki, Y. , et al.	04/10/2000
US-6,541,353	04/01/2003	Sandhu, Gurtej S., et al.	08/31/2000
US-6,551,893	04/22/2003	Zheng, L. , et al.	12/27/2001
US-6,559,472	05/06/2003	Sandhu, Gurtej , et al.	01/14/2002
US-6,586,349	07/01/2003	Jeon, J. S., et al.	02/21/2002
US-6,596,636	07/22/2003	Sandhu, Gurtej S., et al.	01/31/2002
US-6,613,656	09/02/2003	Li, Weiman	02/13/2001
US-6,620,670	09/16/2003	Song, K. , et al.	01/18/2002
US-6,627,260	09/30/2003	Derderian, Garo J., et al.	09/30/2002
US-6,627,503	09/30/2003	Ma, Y. , et al.	04/30/2002
US-6,632,279	10/14/2003	Ritala, M. , et al.	10/13/2000
US-6,639,267	10/28/2003	Eldridge, Jerome M.	07/29/2002
US-6,645,882	11/11/2003	Halliayal, Arvind , et al.	01/17/2002
US-6,660,660	12/09/2003	Haukka, S. P., et al.	08/31/2001
US-6,661,058	12/09/2003	Ahn, Kie Y., et al.	02/11/2002
US-6,673,701	01/06/2004	Marsh, Eugene , et al.	08/27/2002
US-6,674,138	01/06/2004	Halliayal, A. , et al.	12/31/2001
US-6,683,011	01/27/2004	Smith, R. C., et al.	11/14/2001

EXAMINER



DATE CONSIDERED

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		First Named Inventor	Ahn, Kie
		Group Art Unit	2823
		Examiner Name	Toledo, Fernando
Sheet 4 of 5		Attorney Docket No: 1303.101US1	

<i>JK</i>	US-6,696,332	02/24/2004	Visokay, M. R., et al.	06/21/2002
	US-6,699,747	03/02/2004	Ruff, Alexander , et al.	11/18/2002
	US-6,713,846	03/30/2004	Senzaki, Y.	01/25/2002
	US-6,730,575	05/04/2004	Eldridge, Jerome M.	08/30/2001
	US-6,750,066	06/15/2004	Cheung, F. T., et al.	04/08/2002
	US-6,767,795	07/27/2004	Ahn, K. , et al.	01/17/2002
	US-6,780,704	08/24/2004	Raaijmakers, Ivo , et al.	12/03/1999
	US-6,821,862	11/23/2004	Cho, Hag-Ju	06/27/2001
	US-6,831,315	12/14/2004	Raaijmakers, Ivo , et al.	02/22/2001
	US-6,844,203	01/18/2005	Ahn, K. Y., et al.	08/30/2001
<i>JK</i>	US-6,852,167	02/08/2005	Ahn, K. Y.	03/01/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T ²
<i>JK</i>	EP-0540993A1	05/12/1993	Argos, Jr., G. , et al.	
<i>JK</i>	EP-1324376A1	07/02/2003	Girardie, L.	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>JK</i>		CHIN, A. , et al., "High Quality La ₂ O ₃ and Al ₂ O ₃ Gate Dielectrics with Equivalent Oxide Thickness 5-10A", Digest of Technical Papers. 2000 Symposium on VLSI Technology, 2000, Honolulu,(June 13-15, 2000),16-17	
		COPEL, M. , et al., "Formation of a stratified lanthanum silicate dielectric by reaction with Si(001)", <u>Applied Physics Letters</u> , 78(11), (March 12, 2001),1607-1609	
		GUHA, S , et al., "Atomic beam deposition of lanthanum-and yttrium-based oxide thin films for gate dielectrics", <u>Applied Physics Letters</u> , 77, (2000),2710-2712	
		HOSHINO, Y. , et al., "Characterization and Control of the HfO ₂ /Si(001) Interfaces", <u>Applied Physics Letters</u> , 81, (Sep. 30, 2002),2650-2652	
		HUANG, C. H., et al., "La ₂ O ₃ /Si ₃ N ₄ 0.3/Ge _{0.7} p-MOSFETs with high hole mobility and good device characteristics", <u>IEEE Electron Device Letters</u> , 23(12), (December 2002),710-712	
		IWAI, H. , et al., "Advanced gate dielectric materials for sub-100 nm CMOS", <u>International Electron Devices Meeting</u> , 2002. IEDM '02. Digest., (December 8-11, 2002),625-628	
		MARIA, J. P., et al., "High temperature stability in lanthanum and zirconia-based gate dielectrics", <u>Journal of Applied Physics</u> , 90(7), (October 1, 2001),3476-3482	
		MICHAELSON, HERBERT B., "The work function of the elements and its periodicity", <u>Journal of Applied Physics</u> , 48(11), (November 1977),4729-4733	
<i>JK</i>		YAMADA, HIROTOSHI , et al., "MOCVD of High-Dielectric-Constant Lanthanum Oxide Thin Films", <u>Journal of The Electrochemical Society</u> , 150(8), (August 2003),G429-G435	

EXAMINER

DATE CONSIDERED

5/26/05

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Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>AK</i>		ZHONG, HUICAI , et al., "Electrical Properties of Ru and RuO ₂ Gate Electrodes for Si-PMOSFET with ZrO ₂ and Zr-Silicate Dielectrics", <u>Journal of Electronic Materials</u> , 30(12), (December 2001),1493	

EXAMINER

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US PATENT DOCUMENTS

Examiner Initials*	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-2003/0042526	03/06/2003	Weimer, Ronald A.	257	309	08/29/2001
	US-2003/0052356	03/20/2003	Yang, Haining , et al.	257	309	10/11/2002
	US-2003/0052358	03/20/2003	Weimer, Ronald A.	257	310	10/25/2002
	US-2003/0102501	06/05/2003	Yang, Haining , et al.	257	295	12/12/2002
	US-2003/0119313	06/26/2003	Yang, Haining , et al.	438	681	12/05/2002
	US-2003/0222300	12/04/2003	Basceri, Cem , et al.	257	309	03/13/2003
	US-2003/0228747	12/11/2003	Ahn, Kie Y., et al.	438	591	06/05/2002
	US-6,120,531	09/19/2000	Zhou, Lin , et al.	607	111	10/17/1997
	US-6,187,484	02/13/2001	Glass, Thomas R., et al.	430	5	08/31/1999
	US-6,518,610	02/11/2003	Yang, Haining , et al.	257	295	02/20/2001
	US-6,524,867	02/25/2003	Yang, Haining , et al.	438	3	12/28/2000
	US-6,573,199	06/03/2003	Sandhu, Gurtej S., et al.	438	798	08/30/2001
	US-6,593,610	07/15/2003	Gonzalez, Fernando	257	296	12/13/2001
	US-6,608,378	08/19/2003	Ahn, Kie Y., et al.	257	701	08/26/2002
	US-6,613,702	09/02/2003	Sandhu, Gurtej S., et al.	438	798	01/17/2003
	US-6,683,005	01/27/2004	Sandhu, Gurtej S., et al.	438	715	01/17/2003

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
	EP-1096042	05/02/2001	Ramdani, J. , et al.	C30B	25/02	
	EP-1124262	08/16/2001	Ma, Y. , et al.	H01L	29/51	
	JP-11-335849	12/07/1999	Horie, K. , et al.	C23 C	16/44	
	JP-2001-332546	11/30/2001	Kazuhide, Ino	H01L	21/316	
	JP-5090169	04/09/1993	Watanabe, Kunihiko , et al.			
	JP-62-199019	09/02/1987	Takaaki, Sasaki			
	WO-01/97257	12/20/2001	Madhukar, S. , et al. .	H01L		
	WO-02/31875	04/18/2002	Haukka, S. , et al.	H01L	21/316	
	WO-02/43115	05/30/2002	Pomarede, C. F., et al.	H01L		
	WO-0233729A2	04/25/2002	Fink, S. T.	H01J	37/32	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (In CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s); publisher, city and/or country where published.	T ²
		AARIK, JAAN , et al., "Influence of substrate temperature on atomic layer growth and properties of HfO _x sub 2 / thin films", Thin Solid Films, 340(1-2), (1999),110-116	
		AARIK, JAAN , et al., "Phase transformations in hafnium dioxide thin films grown by atomic layer deposition at high temperatures", Applied Surface Science, 173(1-2),	

EXAMINER

DATE CONSIDERED

5/26/05

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		(March 2001),15-21	
		AARIK, JAAN , et al., "Texture development in nanocrystalline hafnium dioxide thin films grown by atomic layer deposition", <u>Journal of Crystal Growth</u> , 220(1-2), (November 15, 2000),105-113	
		BENDORAITIS, J G., et al., "Optical energy gaps in the monoclinic oxides of hafnium and zirconium and their solid solutions", <u>Journal of Physical Chemistry</u> , 69(10), (1965),3666-3667	
		BUNSHAH, ROINTAN F., et al., "Deposition Technologies for Films and Coatings: Developments and Applications", Park Ridge, N.J., U.S.A. : Noyes Publications, (1982),102-103	
		CALLEGARI, A. , et al., "Physical and electrical characterization of Hafnium oxide and Hafnium silicate sputtered films", <u>Journal of Applied Physics</u> , 90(12), (December 15, 2001),6466-75	
		CHENG, BAOHONG , et al., "The Impact of High-k Gate Dielectrics and Metal Gate Electrodes on Sub-100nm MOSFET's", <u>IEEE Transactions on Electron Devices</u> , 46(7), (July 1999),1537-1544	
		CLARK, P, "IMEC Highlights Hafnium, Metal Gates for High-k Integration", <u>Semiconductor Business News</u> , at Silicon Strategies.com,(10/11/02),2 pages	
		CLARK-PHELPS, R. B., et al., "Engineered Tantalum Aluminate and Hafnium Aluminate ALD Films for Ultrathin Dielectric Films with Improved Electric and Thermal Properties", <u>Gate Stack and Silicide Issues in Silicon Processing II. Symposium (Materials Research Society Symposium Proceedings Vol.670)</u> , (Apr. 17, 2001),K2.2.1-6	
		FORSGREN, KATARINA , "Atomic Layer Deposition of HfO ₂ using hafnium iodide", Conference held in Monterey, California, (May 2001),1 page	
		FORSGREN, KATARINA , "CVD and ALD of Group IV- and V-Oxides for Dielectric Applications", <u>Comprehensive Summaries of Uppsala Dissertation from the Faculty of Science and Technology</u> , 665, (2001),	
		GUSEV, E P., et al., "Ultrathin High-K Dielectrics Grown by Atomic Layer Deposition: A Comparative Study of ZrO ₂ , HfO ₂ , Y ₂ O ₃ and Al ₂ O ₃ ", <u>Electrochemical Society Proceedings Volume 2001-9</u> , (2001),189-195	
		GUTOWSKI, M J., "Thermodynamic stability of high-K dielectric metal oxides ZrO ₂ and HfO ₂ in contact with Si and SiO ₂ ", <u>Applied Physics Letters</u> , 80(11), (March 18, 2002),1897-1899	
		HUBBARD, K. J., "Thermodynamic stability of binary oxides in contact with silicon", <u>Journal of Materials Research</u> , 11(11), (November 1996),2757-2776	
		JEON, SANGHUN , et al., "Excellent electrical characteristics of lanthanide (Pr, Nd, Sm, Gd, and Dy) oxide and lanthanide-doped oxide for MOS gate dielectric applications", <u>Electron Devices Meeting, 2001. IEDM Technical Digest. International</u> , (2001),471-474	
		JUNG, H S., et al., "Improved current performance of CMOSFETs with nitrogen	

EXAMINER

DATE CONSIDERED

INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete if Known	
		Application Number	10/602,323
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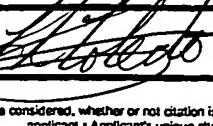
OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>MM</i>		incorporated HfO _x Al ₂ O ₅ laminate gate dielectric", <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002), 853-856	
		KANG, L , et al., "MOSFET devices with polysilicon on single-layer HfO _x Al ₂ O ₅ high-K dielectrics", <u>International Electron Devices Meeting 2000</u> , Technical Digest. IEDM, (2000), 35-8	
		KUKLI, K , et al., "Comparison of hafnium oxide films grown by atomic layer deposition from iodide and chloride precursors", <u>Thin Solid Films</u> , 416, (2002), 72-79	
		KUKLI, KAUPO , et al., "Influence of thickness and growth temperature on the properties of zirconium oxide films growth by atomic layer deposition on silicon", <u>Thin Solid Films</u> , 410(1-2), (2002), 53-60	
		KUKLI, K J., et al., "Properties of hafnium oxide films grown by atomic layer deposition from hafnium tetraiodide and oxygen", <u>Journal of Applied Physics</u> , 92(10), (November 15, 2002), 5698-5703	
		KWO, J. , et al., "High gate dielectrics Gd ₂ O ₃ and Y ₂ O ₃ for silicon", <u>Applied Physics Letters</u> , 77(1), (July 3, 2000), 130-132	
		KWO, J. , "Properties of high k gate dielectrics Gd ₂ O ₃ and Y ₂ O ₃ for Si", <u>Journal of Applied Physics</u> , 89(7), (2001), 3920-3927	
		LEE, BYOUNG H., et al., "Characteristics of TaN gate MOSFET with ultrathin hafnium oxide (8 Å-12 Å)", <u>Electron Devices Meeting, 2000</u> , IEDM Technical Digest. International, (2000), 39-42	
		LEE, A E., et al., "Epitaxially grown sputtered LaAlO ₃ films", <u>Applied Physics Letters</u> , 57(19), (November 1990), 2019-2021	
		LEE, S. J., et al., "Hafnium oxide gate stack prepared by in situ rapid thermal chemical vapor deposition process for advanced gate dielectrics", <u>Journal of Applied Physics</u> , 92 (5), (September 1, 2002), 2807-09	
		LEE, S J., et al., "High quality ultra thin CVD HfO ₂ gate stack with poly-Si gate electrode", <u>Electron Devices Meeting, 2000</u> , IEDM Technical Digest. International, (2000), 31-34	
		LEE, JUNG-HYOUNG , et al., "Mass production worthy HfO _x Al ₂ O ₅ laminate capacitor technology using Hf liquid precursor for sub-100 nm DRAMs", <u>Electron Devices Meeting, 2002</u> , IEDM '02. Digest. International, (2002), 221-224	
		LEE, DONG H., et al., "Metalorganic chemical vapor deposition of TiO ₂ :N anatase thin film on Si substrate", <u>Appl. Phys. Lett.</u> , 66(7), (February 1995), 815-816	
		LEE, et al., "Ultrathin Hafnium Oxide with Low Leakage and excellent Reliability for Alternative Gate Dielectric Application", <u>IEEE Technical Digest of International Electron Devices Meeting 1999</u> , (1999), 133-136	
		LESKELA, M. , et al., "ALD precursor chemistry: Evolution and future challenges", <u>J. Phys. IV France</u> , 9, (1999), 837-852	
		LUCOVSKY, G , et al., "Microscopic model for enhanced dielectric constants in low concentration SiO _x Al ₂ O ₅ rich noncrystalline Zr and Hf silicate alloys", <u>Applied Physics Letters</u> , 77(18), (October 2000), 2912-2914	

EXAMINER *MM*

DATE CONSIDERED *1/26/05*

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete If Known	
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		MOLODYK, A A., et al., "Volatile Surfactant-Assisted MOCVD: Application to LaAlO ₃ Thin Film Growth", <u>Chemical Vapor Deposition</u> , 6(3), (June 2000), 133-138	
		MULLER, D. A., "The electronic structure at the atomic scale of ultrathin gate oxides", <u>Nature</u> , 399(6738), (June 24, 1999), 758-61	
		NEUMAYER, D A., et al., "Materials characterization of ZrO _x /SiO ₂ and HfO _x /SiO ₂ binary oxides deposited by chemical solution deposition", <u>Journal of Applied Physics</u> , 90(4), (August 15, 2001), 1801-1808	
		NIEMINEN, MINNA , et al., "Formation and stability of lanthanum oxide thin films deposited from B-diketonate precursor", <u>Applied Surface Science</u> , 174(2), (April 16, 2001), 155-165	
		OHMI, S. , et al., "Rare Earth Metal Oxides for High-K Gate Insulator", <u>Electrochemical Society Proceedings</u> , Volume 2002-2, (2002), 376-387	
		OSTEN, H J., et al., "High-k Gate Dielectrics with Ultra-low Leakage Current Based on Praseodymium Oxide", <u>Technical Digest of IEDM</u> , (2000), 653-656	
		PARK, JAEHOO , et al., "Chemical vapor deposition of HfO _x /Si thin films using a novel carbon-free precursor: characterization of the interface with the silicon substrate", <u>Journal of the Electrochemical Society</u> , 149(1), (2002), G89-G94	
		PARK, BYOUNG K., et al., "Interfacial reaction between chemically vapor-deposited HfO ₂ thin films and a HF-cleaned Si substrate during film growth and postannealing", <u>Applied Physics Letters</u> , 80(13), (April 1, 2002), 2368-70	
		POVESHCHENKO, V P., et al., "Investigation of the phas composition of films of zirconium, hafnium and yttrium oxides", <u>Soviet Journal of Optical Technology</u> , 51(5), (1984), 277-279	
		RITALA, MIKKO , "Atomic Layer Epitaxy Growth of Titanium, Zirconium and Hafnium Dioxide Thin Films", <u>Annales Academiae Scientiarum Fenniae</u> , (1994), 24-25	
		ROBERTSON, J. , "Band offsets of wide-band-gap oxides and implications for future electronic devices", <u>Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures)</u> , 18(3), (May-June 2000), 1785-1791	
		SMITH, RYAN C., et al., "Chemical Vapour Deposition of the Oxides of Titanium, Zirconium and Hafnium for Use as High-k Materials in Microelectronic Devices. A Carbon-free Precursor for the Synthesis of Hafnium Dioxide", <u>Advanced Materials for Optics and Electronics</u> , 10(3-5), (June 29, 2000), 105-14	
		SNEH, OFER , "Thin film atomic layer deposition equipment for semiconductor processing", <u>Thin Solid Films</u> , 402(1-2), (Jan. 1, 2002), 248-261	
		SUNTOLA, T. , "Atomic Layer Epitaxy", <u>Handbook of Crystal Growth</u> , 3: Thin Films of Epitaxy, Part B: Growth Mechanics and Dynamics, Amsterdam, (1994), 602-663	
		SUNTOLA, T. , "Atomic layer epitaxy", <u>Thin Solid Films</u> , 216(1), (August 28, 1992), 84-89	
		TAVEL, B , et al., "High performance 40 nm nMOSFETs with HfO _x /Si thin films as gate dielectric and polysilicon damascene gate", <u>Technical Digest of International Electron</u>	

EXAMINER 

DATE CONSIDERED 

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete if Known	
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		Devices Meetings 2002, (2002),429-432	
		VAN DOVER, R. B., et al., "Amorphous lanthanide-doped TiO _x dielectric films", <u>Applied Physics Letters</u> , 74(20), (May 17, 1999),3041-3043	
		WILK, G D., "Hafnium and zirconium silicates for advanced gate dielectrics", <u>Journal of Applied Physics</u> , 87(1), (January 2000),484-492	
		WOLF, STANLEY , et al., "Future Trends in Sputter Deposition Processes", In: <u>Silicon Processing of the VLSI Era</u> , Vol. 1, Lattice Press,(1986),374-380	
		YAMAMOTO, K. , et al., "Effect of Hf metal predeposition on the properties of sputtered HfO ₂ /Hf stacked gate dielectrics", <u>Applied Physics Letters</u> , 81(11), (September 9, 2002),2053-5	
		ZHANG, H. , "Atomic Layer Deposition of High Dielectric Constant Nanolaminates", <u>Journal of The Electrochemical Society</u> , 148(4), (April 2001),F63-F66	
		ZHANG, H , "High permittivity thin film nanolaminates", <u>Journal of Applied Physics</u> , 87(4), (February 2000),1921-1924	
		ZHU, W , et al., "HfO ₂ and HfAlO for CMOS: Thermal Stability and Current Transport", <u>IEEE International Electron Device Meeting 2001</u> , (2001),463-466	

EXAMINER

DATE CONSIDERED

5/26/05

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Complete if Known Application Number 10/602323 Filing Date June 24, 2003 First Named Inventor Ahn, Kie Group Art Unit 2812 Examiner Name Unknown	
		Sheet 1 of 2 Attorney Docket No: 1303.101US1	

US PATENT DOCUMENTS

Examiner Initials*	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-2003/0042526	03/06/2003	Weimer, Ronald A.	257	309	08/29/2001
	US-2003/0052356	03/20/2003	Yang, Haining , et al.	257	309	10/11/2002
	US-2003/0052358	03/20/2003	Weimer, Ronald A.	257	310	10/25/2002
	US-2003/0102501	06/05/2003	Yang, Haining , et al.	257	295	12/12/2002
	US-2003/0119313	06/26/2003	Yang, Haining , et al.	438	681	12/05/2002
	US-2003/0222300	12/04/2003	Basceri, Cem , et al.	257	309	03/13/2003
	US-2003/0228747	12/11/2003	Ahn, Kie Y., et al.	438	591	06/05/2002
	US-6,120,531	09/19/2000	Zhou, Lin , et al.	607	111	10/17/1997
	US-6,187,484	02/13/2001	Glass, Thomas R., et al.	430	5	08/31/1999
	US-6,518,610	02/11/2003	Yang, Haining , et al.	257	295	02/20/2001
	US-6,524,867	02/25/2003	Yang, Haining , et al.	438	3	12/28/2000
	US-6,573,199	06/03/2003	Sandhu, Gurtej S., et al.	438	798	08/30/2001
	US-6,593,610	07/15/2003	Gonzalez, Fernando	257	296	12/13/2001
	US-6,608,378	08/19/2003	Ahn, Kie Y., et al.	257	701	08/26/2002
	US-6,613,702	09/02/2003	Sandhu, Gurtej S., et al.	438	798	01/17/2003
	US-6,661,058	12/09/2003	Ahn, Kie Y., et al.	257	344	02/11/2002
	US-6,683,005	01/27/2004	Sandhu, Gurtej S., et al.	438	715	01/17/2003

FOREIGN PATENT DOCUMENTS

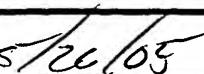
Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
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OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

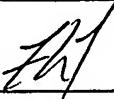
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		AARIK, JAAN , et al., "Influence of substrate temperature on atomic layer growth and properties of HfO _x sub 2/ thin films", <i>Thin Solid Films</i> , 340(1-2), (1999), 110-116	

EXAMINER

DATE CONSIDERED



Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete if Known
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Examiner Name		
Unknown		
Sheet 2 of 2		
Attorney Docket No: 1303.101US1		

	BENDORAITIS, J G., et al., "Optical energy gaps in the monoclinic oxides of hafnium and zirconium and their solid solutions", <u>Journal of Physical Chemistry</u> , 69(10), (1965), 3666-3667
	GUTOWSKI, M J., "Thermodynamic stability of high-K dielectric metal oxides ZrO ₂ and HfO ₂ in contact with Si and SiO ₂ ", <u>Applied Physics Letters</u> , 80(11), (March 18, 2002), 1897-1899
	JEON, SANGHUN , et al., "Excellent electrical characteristics of lanthanide (Pr, Nd, Sm, Gd, and Dy) oxide and lanthanide-doped oxide for MOS gate dielectric applications", <u>Electron Devices Meeting, 2001. IEDM Technical Digest International</u> , (2001), 471-474
	KUKLI, K , et al., "Comparison of hafnium oxide films grown by atomic layer deposition from iodide and chloride precursors", <u>Thin Solid Films</u> , 416, (2002), 72-79
	KUKLI, KAUPO , et al., "Influence of thickness and growth temperature on the properties of zirconium oxide films growth by atomic layer deposition on silicon", <u>Thin Solid Films</u> , 410(1-2), (2002), 53-60
	KUKLI, K J., et al., "Properties of hafnium oxide films grown by atomic layer deposition from hafnium tetraiodide and oxygen", <u>Journal of Applied Physics</u> , 92(10), (November 15, 2002), 5698-5703
	POVESHCHENKO, V P., et al., "Investigation of the phas composition of films of zirconium, hafnium and yttrium oxides", <u>Soviet Journal of Optical Technology</u> , 51(5), (1984), 277-279
	ROBERTSON, J. , "Band offsets of wide-band-gap oxides and implications for future electronic devices", <u>Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures)</u> , 18(3), (May-June 2000), 1785-1791
	SNEH, OFER , et al., "Thin film atomic layer deposition equipment for semiconductor processing", <u>Thin Solid Films</u> , 402(1-2), (Jan. 1, 2002), 248-261
	ZHANG, H , et al., "High permittivity thin film nanolaminates", <u>Journal of Applied Physics</u> , 87(4), (February 2000), 1921-1924

EXAMINER

DATE CONSIDERED